

In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) An apparatus for determining a total concentration of a component in a sample, comprising:
 - a reactor for oxidizing or reducing the sample;
 - a chromatographic column coupled to said reactor for separating the component in the sample;
 - an electrochemical gas sensor directly coupled to said chromatographic column for detecting the component;
 - wherein said electrochemical gas sensor has a substrate, the substrate having:a surface for depositing electrodes thereon,
 - an ionomer membrane in contact with said substrate surface,
 - the ionomer membrane having a first surface and a second surface,
 - an electrode in contact with said substrate surface,
 - an opening extending from said first surface to said second surface in a location proximate to said electrode for defining a passage; and
 - a three way contact gas between said gas, electrode, and ionomer membrane within said opening wherein gas in said opening and simultaneously contacting said electrode and said ionomer membrane for providing a three way contact between said gas, electrode, and ionomer membrane within said opening.
2. (cancelled)
3. (currently amended) An apparatus for determining a total concentration of a desired component in a sample, comprising:

a reactor for oxidizing or reducing the sample;

a gas chromatograph column coupled to said reactor for separating the component in the sample;

at least two chemical filters coupled to said reactor, each chemical filter for filtering out a different undesirable component and for permitting the desired component to pass through based upon chemical properties of the undesirable and desirable components; and

a detector directly coupled to each of said at least two filters for detecting the desired component.

4. (cancelled)

5. (cancelled)

6. (original) The apparatus according to claim 3, wherein said detector is a plurality of electrochemical sensors for detecting multiple components.

7. (withdrawn) An apparatus for determining a total concentration of various components in a sample, comprising:

a reactor for oxidizing or reducing the sample;

a first electrochemical gas sensor coupled to said reactor and having an adjustment mechanism, wherein said adjustment mechanism is selectively adjustable to detect for the presence of a selected one of a plurality of components; and

a second electrochemical gas sensor coupled to said reactor and having an adjustment mechanism, wherein said adjustment mechanism is selectively adjustable to detect for the presence of a selected one of a plurality of components.

8. (withdrawn) The apparatus according to claim 7, wherein each of said first and second electrochemical gas sensors further comprises a substrate having a surface for depositing electrodes thereon; an ionomer membrane in contact with said surface of said substrate and having a first surface and a second surface; an electrode in contact with said surface of said substrate; an opening extending from said first surface to said second surface in a location proximate to said electrode for defining a passage; and a gas in said opening and simultaneously contacting said electrode and said ionomer membrane for providing a three way contact between said gas, electrode, and ionomer membrane within said opening.

9. (withdrawn) The apparatus according to claim 7, further comprising a plurality of electrochemical gas sensors coupled to said reactor and each of said plurality of electrochemical gas sensors having a respective adjustment mechanism for detecting each of the various components.

10. (withdrawn) The apparatus according to claim 7, further comprising a filter coupled to said reactor for filtering out undesirable components and for permitting desirable components to pass through to said first and second electrochemical gas sensors.

11. (currently amended) A method for determining a total concentration of a component in a sample, comprising the steps of:

oxidizing or reducing the sample in a reactor;
separating the component from the sample using a separation device;
directly coupling an electrochemical gas sensor to the separation device for detecting the component;
providing a substrate having a surface for depositing electrodes thereon;
depositing an electrode on the substrate surface;

contacting an ionomer membrane with the electrode;
providing an opening in the ionomer membrane in an approximate area of the electrode;
extending the opening from a first surface of the ionomer membrane to a second surface of the ionomer membrane for defining a passage; and
placing a gas in the opening and contacting the gas simultaneously with the electrode and ionomer membrane within the opening.

12 (original) The method according to claim 11, further comprising the step of separating the component from the sample using a gas chromatograph column.

13. (cancelled)

14. (original) The method according to claim 11, further comprising the step of coupling a plurality of electrochemical gas sensors to the separation device for detecting multiple components.

15. (original) The method according to claim 11, further comprising the steps of filtering out undesirable components and permitting desirable components to pass through.

16. (currently amended) A method for determining a total concentration of a component in a sample, comprising the steps of:

oxidizing or reducing the sample in a reactor;
using a first chemical filter for filtering out a first undesirable component and permitting a desirable component to pass through based upon chemical properties of the undesirable and desirable components;

using a second chemical filter for filtering out a second undesirable component and permitting a desirable component to pass through based upon chemical properties of the undesirable and desirable components;and

directly coupling a detector to each filter for detecting the desirable component.

17. (cancelled)

18. (previously presented) The apparatus according to claim 3, further comprising a chromatographic column positioned between said reactor and said filter for separating the component in the sample.

19. (previously presented) The method according to claim 16, further comprising the step of separating the sample into its respective components.

20. (new) The apparatus according to claim 3, wherein said at least two filters are arranged in parallel to one another.

21. (new) The method according to claim 16, further comprising the step of arranging the at least two filters in parallel with one another.